

## BIBLIOGRAPHICAL NOTICES.

*Principles of Scientific Botany; or Botany as an Inductive Science.*

By Dr. M. J. SCHLEIDEN, Extraordinary Professor of Botany in the University of Jena. Translated by EDWIN LANKESTER, M.D., F.R.S. &c. London, Longman and Co., 1849. Pp. 616. Woodcuts and 6 Plates.

WHATEVER may be the opinion as to the correctness of Professor Schleiden's views upon certain questions, in connexion with which his name is best known in this country, there can be no doubt that he ranks among the first original observers of the present day, and this work is undoubtedly the most valuable systematic exposition of the structural department of botany which has yet been given to the world. The thanks of the botanists of this country are therefore due to Dr. Lankester for the present translation, which although by no means free from blemishes, may be received, on the whole, as a fair average rendering of a work which is admitted to present considerable difficulties.

We cannot afford space, supposing even it were desirable in this place, to enter upon the discussion of the many points on which Prof. Schleiden is at issue with many other celebrated botanists; we must simply indicate that these are fully considered in this work. An appendix contains some important changes given in a third edition of the first part of the original, which appeared while this translation was in the press. From this it will be seen that Prof. Schleiden has greatly modified his earlier views on cell-development, and now approaches an agreement with his opponents.

The work is divided into four books:—1. The Chemistry of Plants, on which subject the author goes into much greater detail than was usual with botanical writers until the publication of this treatise. 2. On the Plant-cell, under which head all the forms of the elementary tissues are treated, as also the physiology of these structures. 3. Morphology, divided into general and special; the second comprehending a minute account of the organization of all the great classes of plants, the Cryptogamic being examined separately and successively, while the Monocotyledons and Dicotyledons are reviewed together under sections founded on their different organs. This portion of the work is very rich in original observation, and is particularly characterized by the peculiar views of the author, especially by the strict definition of *axial* and *foliar* organs, the views entertained respecting placentation, the nature of ovules, and the doctrine maintained concerning the origin of the embryo. The 4th book is entitled Organology, by which we understand Physiology. Sect. D. contains some very important matter on the subject of the processes of Nutrition. While arguing strongly in favour of the views of Liebig and others, that the chief portion of the carbon and ammonia required by plants is received by them in an inorganic condition, he admits the possibility and even the probability of the absorption of organic compounds, as urged by Mulder: the possibility is evident from the physiology of parasitic plants, and the plants

peculiar to peat-bogs are instanced as cases where it is not unlikely that organized substances are imbibed. Moreover, the author dwells upon the fact that it is only the *root-cells* which really assimilate inorganic substances; he upholds the opinion that assimilation takes place in the very act of the primary absorption, and that thus there does not exist any which can be properly called *crude sap*; the assimilated matter derived from the roots is modified by the various organs into which it passes, according to their special character. He rejects *in toto* the idea of a circulation of the sap, regarding the passage of fluids through all plants as a mere distribution from cell to cell, such as takes place in wholly cellular structures. It appears to us that this hypothesis is too sweeping. There can be no doubt that the ducts or large tubular forms of the tissue frequently open into each other after they have attained a certain age, thus forming continuous canals, and it is equally certain that these occur in the vascular bundles, especially in the wood. There seems to be no reason to doubt that mere capillarity will cause the fluids to ascend in these ducts when a current is maintained by the evaporation from the leaves. With respect to a descending current, there is great likelihood that Profs. Schleiden and Mulder are right in denying it, and asserting that all the phenomena supposed to result from it are to be explained by the process of endosmosis, which is indeed the principal cause of the ascending current. We can hardly imagine a current upward *and* downward in the vessels; but in endosmosis there is an interchange,—a passage in both directions with an ultimate tendency to equilibrium. Careful experiments are still wanting on this subject.

In the appendix to the translation are: A. Analytical papers; B. A list of old trees; C. The extracts from the third German edition of books 1 and 2 already referred to; and D. An article on the use of the Microscope from the "Methodological Basis" prefixed to the original work, but which is omitted in the translation in order to diminish the bulk of the volume.

The volume is well illustrated wholly from the author's own drawings, a rather unusual circumstance, but of course greatly adding to its value.

No one interested in scientific botany should be without the work.

## PROCEEDINGS OF LEARNED SOCIETIES.

### ZOOLOGICAL SOCIETY.

December 12, 1848.—R. C. Griffith, Esq., F.G.S., in the Chair.

Dr. Melville communicated orally the first part of his paper "On the Ideal Vertebra." He commenced by defining this as "the most complete possible segment of the endo-skeleton," or in the words of his friend Mr. Maclise, "the plus vertebral quantity;" and it was illustrated by a diagram showing the body, neural arch and